

Research Article

Correlation between Perceived Stress and Blood Pressure among Adults

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Abstract: Objective: Hypertension is more common in cities than it is in rural regions. Indo-Asian people are among the populations with the highest risk of cardiovascular disease in the world. Stress has become a part of our life due to hectic lifestyle that we have and so is the lifestyle disorders like hypertension. The aim of this study is to find the correlation between blood pressure and perceived stress and how they are related. **Method:** In this correlation study 30 individuals were selected. Basic demographic data was collected and were asked to fill up the Perceived stress scale. Blood pressure was measured at the brachial artery three times and average of the three was taken. To study the relation between stress score and BP, correlation was done. As data were not normally distributed, Spearman correlation test was done ($P < 0.001$). **Results:** According to the analysis done, PSS shows moderate correlation with SBP while DBP shows weak correlation with r values 0.47 and 0.202 respectively and p values 0.806 and 0.283 respectively. **Conclusion:** Stress is significantly related to hypertension and is an independent risk factor for hypertension.

Keyword: Blood pressure, hypertension, stress, perceived stress score, correlation.

Introduction

Although hypertension is a widespread illness that affects 15% of India's adult population, great progress has been achieved in preventing and controlling it.^[1] Hypertension is more common in cities than it is in rural regions.^[2] Indo-Asian people are among the populations with the highest risk of cardiovascular disease in the world.^[3] Hypertension is one of the leading causes of premature morbidity and mortality in both industrialized and developing countries, according to the World Health Organization.^[4] For people with arterial hypertension, international medical standards prescribe lifestyle adjustments such as physical activity and stress management.^[5]

Psychological stress is a key risk factor for a variety of diseases, including cardiovascular disease, cancer, arthritis, and serious depression.^[6] Stress and its psychological manifestations are an unavoidable part of human life and a major source of concern in today's society.^[7] When a person is stressed, their failure to comply with external requirements causes psychological and biological changes, putting them at risk of illness.^[8] Workplace stress is on the rise, and it's having a big impact on the emergence of a lot of psychosomatic ailments, such as arterial hypertension.^[9,10] While it is widely accepted that acute stressors (such as fear, anger, anxiety, and other physical stressors like noise or accidents) cause a short-term increase in blood pressure (BP), it is less clear whether a continuous stressor will result in a 'fixed' hypertension over time ('reactivity hypothesis').^[11] A high

BP perusing is regularly deciphered to be caused basically partially by pressure. Distinctive pressure circumstances prompting expanded BP have been distinguished. Everyone is presented to pressure factors which might be of significance in the pathogenesis of various infections, nonetheless, the pressure insight and the reaction to push are very heterogeneous.^[12] Thus, it shocks no one that the writing on the connection between self-saw pressure and BP is uncertain.^[12,13,14]

Stress has become a part of our life due to hectic lifestyle that we have and so is the lifestyle disorders like hypertension. The aim of this study is to find the correlation between blood pressure and perceived stress and how they are related.

Hypothesis

Null Hypothesis: There is no correlation between stress and blood pressure.

Experimental Hypothesis: There is correlation between stress and blood pressure.

Objective of the study

- 1) To find the correlation between Perceived Stress Score (PSS) and Systolic Blood Pressure (SBP) in adults.
- 2) To find the correlation between Perceived Stress Score (PSS) and Diastolic Blood Pressure (DBP) in adults.

Materials and Methodology

In this correlation study, OPD based patients with blood pressure $\geq 120/80$ or k/c/o HTN or newly diagnosed HTN were invited to be the part of the study. The participation was voluntarily. Out of them 30 individuals agreed to participate. Details about the study were given and oral consent was taken. Basic demographic data was collected and were asked to fill up the Perceived stress scale. Blood pressure was measured at the brachial artery three times and average of the three was taken.

Inclusion Criteria

- ✓ Age group: ≥ 18 years
- ✓ Blood Pressure $\geq 120/80$

Exclusion Criteria

- ✓ Infections
- ✓ Severe psychiatric comorbidities (major depression, dependency disorders, or psychosis)
- ✓ Coronary heart disease, myocardial infarction, pulmonary embolism, or stroke in the previous 3 months
- ✓ Heart failure of NYHA stage $\geq I$
- ✓ Peripheral arterial occlusive disease of stage ≥ 1 ✓ Renal failure of stage >2

Outcome Measure

- ✓ SBP
- ✓ DBP
- ✓ PSS

Statistical Analysis

Statistical analysis was done using Statistical Package for the Social Sciences (SPSS) 25. To study the relation between stress score and BP, correlation was done. As data were not normally distributed, Spearman correlation test was done ($P < 0.001$).

Result

30 participants were included in the study. In this 20 were males and 10 were females (Figure 1).

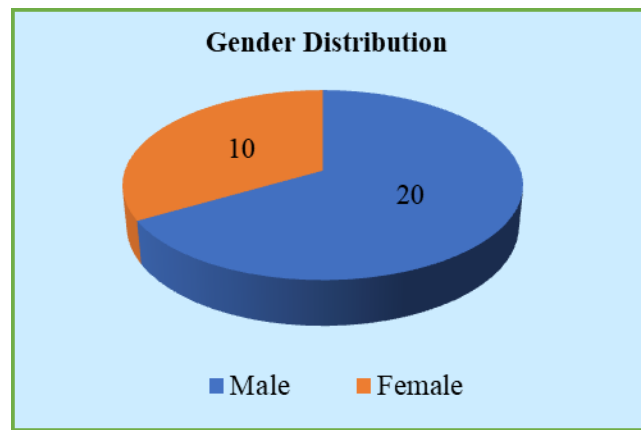


Figure 1. Gender Distribution

According to the analysis done, PSS shows moderate correlation with SBP while DBP shows weak correlation with r values 0.47 and 0.202 respectively (Table 1, Figure 2, and Figure 3).

Table 1. Correlation of PSS with SBP and DBP

	PSS with SBP	PSS with DBP
r	0.47	0.202
p	0.806	0.283
Correlation	Moderate	Weak

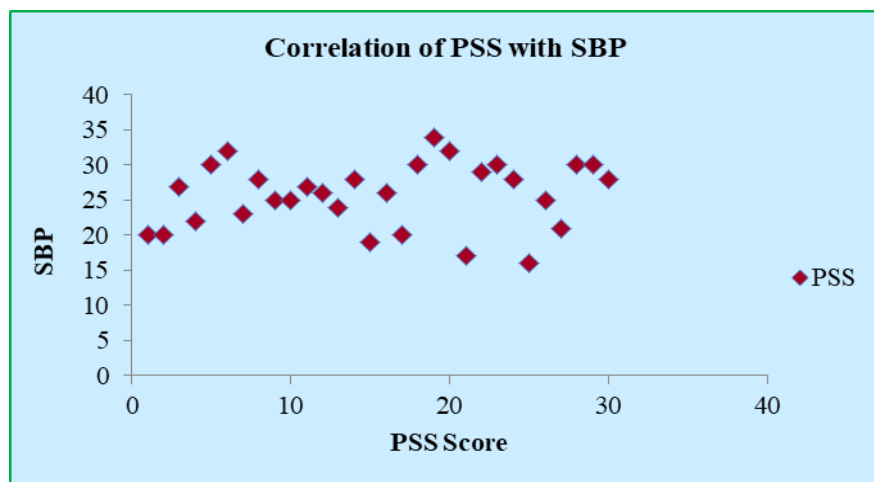


Figure 2. Correlation of PSS with SBP

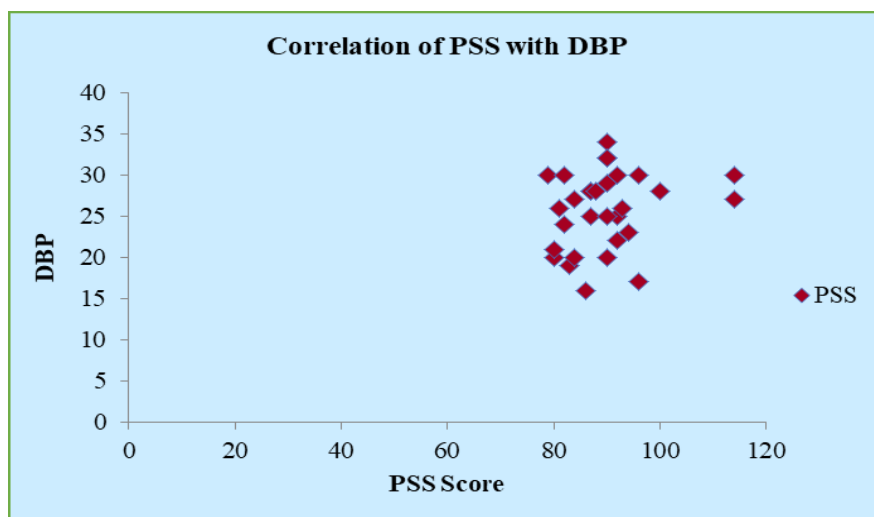


Figure 3. Correlation of PSS with DBP

Females showed better correlation of PSS with SBP and DBP compared to male with r values 0.386, 0.291, 0.264 and 0.107 respectively (Table 2 and Table 3).

Table 2. Correlation of PSS with SBP

	Female	Male
r	0.386	0.291
p	0.44	0.979
Correlation	Weak	Weak

Table 3. Correlation of PSS with DBP

	Female	Male
r	0.264	0.107
p	0.461	0.654
Correlation	Weak	Very Weak

Discussion

Stress is defined as a condition in which an organism's adaptive capacity is strained, resulting in both psychological and biological alterations that may put them at risk for sickness. The link between stress and hypertension has long been hypothesised, as blood pressure and serum cholesterol rise during stressful situations.^[15]

The perceived stress scale was employed in this study to assess stress. It was first created in 1983. It enables us to comprehend how various conditions influence our emotions and stress levels. This scale's questions focus on feelings and thoughts from the previous month.^[16]

In the present study, high stress was significantly associated with hypertension. While there is moderate correlation with SBP, DBP showed weak relationship which is supported by Garda Vera et al^[17] where the sustained hypertension group showed more stress than the normotensive group in a research.

High stress levels were found to be related with hypertension in the current study, while growing stress levels were not. Lin et al^[18] found the opposite, finding a link between stress levels and hypertension development.

There is giant proof to signify that excessive BP is related to continual strain and the manner wherein humans cope. Chronic mental strain is related to expanded activation of the sympathetic-adrenomedullary axis and expanded circulating ranges of adrenaline and noradrenaline. Chronically improved adrenaline ranges had been implicated with inside the improvement and development of and hypertensive topics had been established to have expanded sympathetic and decreased parasympathetic tone as compared to wholesome controls.^[19]

Conversely, behavioral interventions that lessen strain and sympathetic arousal had been proven to be powerful nonpharmacologic remedies for hypertension; such remedies had been related to clinically vast and sustainable BP discounts in addition to decreased fitness care costs.^[19]

When frequently performed, relaxation decreases blood pressure sympathetic autonomic modulation to the heart and sympathetic reactivity, being consequently advocated as a part of the non-drug remedy of hypertension 1 and for retaining a terrific and wholesome existence style. However, the period of this acute cardiac autonomic modulation reaction to rest has now no longer been investigated; neither has the opportunity that hypertensive sufferers can be much less susceptible to a lower in sympathetic and to an increase in parasympathetic coronary heart modulation than normotensive humans.^[20]

The significance of stress in the development of hypertension is debatable.^[11,12] However, there is evidence that controlling some types of stress can be extremely beneficial in the treatment and prevention of essential hypertension.^[12] We discovered an mild connection between self-perceived stress and SBP in this study. This relationship is found in both men and women. While females showed weak positive correlation between stress and both SBP and DBP, males showed weak correlation between stress and SBP and very weak correlation between stress and DBP. This association has nothing to do with age and/or weight. Patients receiving antihypertensive therapy did not show this relationship. No to very weak relationship was found between DBP and stress score.^[21] Suter et al. found that individual stress perception was inversely associated to systolic blood pressure (SBP). There was no link discovered between diastolic blood pressure (DBP) and stress perception.^[21]

In addition to the psychophysiological factors, other stress management strategies can further promote the development of hypertension. Some of these coping mechanisms, especially smoking, drinking, and overeating, can partially and temporarily help control stress, but at the cost of a higher risk of hypertension.^[21]

In this study, we found that there is a moderate relationship between self-perceived stress and SBP. We suspect that the relationship between blood pressure and self-perceived stress reflects the psychological and metabolic environment characterized by insufficient stress management, which can lead to increased blood pressure.

Conclusion

The study found that stress is significantly related to hypertension and is an independent risk factor for hypertension.

Limitation

Since this is a hospital-based study, the study participants may not really represent the population, so the generality is limited.

Consent

Informed consent was obtained from the participants for the study.

Conflicts of interest: The authors declare no conflicts of interest.

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